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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,685	10/28/2003	Alex Harwit	WHB-101/US	5054
30869	7590	11/28/2006	EXAMINER	
LUMEN INTELLECTUAL PROPERTY SERVICES, INC.			BEISNER, WILLIAM H	
2345 YALE STREET, 2ND FLOOR			ART UNIT	
PALO ALTO, CA 94306			PAPER NUMBER	

1744

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/695,685

Applicant(s)

HARWIT ET AL.

Examiner

William H. Beisner

Art Unit

1744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 1744

4. Claims 1-5 and 7-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konrad (US 5,789,167) in view of Northrup et al. (US 6,979,424), Kaji et al. (Biophysical Journal) and Lizardi (US 5,059,294).

The reference of Konrad discloses an apparatus (100) for rapid hybridization that includes a chamber (See column 12, lines 14-41, and column 15, lines 17-27) having a buffer, a first molecule and a second molecule; two electrodes (120 and 130) spaced on either side of the chamber and in direct contact with the chamber.

Claim 1 differs by reciting that the electrodes have hole or provide a gap to vent generated gases and the electrodes are connected to a cyclical electrical field generator.

As discussed in Example 4, the reference of Konrad discloses that the electrodes within the device generate gas during use (See column 23, lines 14-15).

The reference of Northrup et al. discloses that when generating electric fields in sample analysis devices, it is known to provide gas vents for the electrodes that generate the electric fields (See column 6, lines 45-62).

In view of this teaching, it would have been obvious to one of ordinary skill in the art to provide the device of the primary reference with vents for the known and expected result of venting any gases generated within the hybridization chamber that may interfere with the sample analysis.

With respect to the claimed cyclical electrical field generator, Example 4 of Konrad discloses the use of "an electrophoresis power supply" (See column 28, line 4) but is silent as to whether a direct current or alternating current is employed.

The reference of Konrad discloses that different electric fields are used within the device. One type of electric field to increase the rate of concentration or contact between the sample and anchor surface (See column 15, lines 50-52) and another type of electric field to extend the sample molecules (See column 15, lines 52-55).

The reference of Kaji et al. discloses that it is known in the art to extend or stretch nucleic acid molecules between a pair of electrodes using a low frequency electric field (See the abstract).

In view of this teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the system of the reference of Konrad with a power supply for generating a low frequency AC power supply for the known and expected result of providing the system with a means recognized in the art for generating an electric field for extending or stretching the sample oligonucleotide as is required of the primary reference. When generating electric fields using either DC or low frequency AC, one of ordinary skill in the art would readily recognize the potential for gas to be evolved at the electrodes.

As evidenced by the reference of Lizardi, the AC field generated by the power supply of Kaji et al. is capable of providing a cyclic or oscillatory motion (See column 9, lines 24-32, of the reference of Lizardi). Note a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

With respect to claims 2 and 3, one molecule is mobile while one may be immobilized (See "The Probe", column 8, line 12, to column 11, line 38).

Art Unit: 1744

With respect to claim 4, the “anchor sequence” is considered to be part of a microarray.

With respect to claim 5, the molecules can be nucleic acids (See “The Probe” and “The Method” sections).

With respect to claim 7, the chamber includes a lid (See column 12, lines 14-23).

With respect to claims 8 and 9, the reference discloses the use of voltages within the claimed ranges (See column 15, lines 45-65).

With respect to claim 10, the reference of Kaji et al. discloses that a 10Hz frequency can be used.

Additionally, in the absence of a showing of criticality and/or unexpected results, it would have been well within the purview of one having ordinary skill in the art to determine the optimum frequency to cycle the electric field based merely on the properties of the chamber, buffer and/or molecules to be manipulated while maintaining the efficiency of the system.

With respect to claim 11, while the reference is silent as to the specific equipment employed to cycle the electric field, the reference of Kaji et al. discloses the use of an adjustable frequency oscillator and power supply (See Figure 1). As a result one of ordinary skill in the art would have been capable of determining the appropriate structures to used so as to generate the desired oscillating electric field.

With respect to claim 12, while the reference of Konrad discloses maintaining the chamber at a desired temperature (See column 15, lines 27-32), the reference is silent as to the use of a temperature controller. However, the use of a temperature controller for maintaining the desired hybridization temperature would have been obvious to one of ordinary skill in the art so as to ensure that the chamber is maintained as the desired temperatures.

With respect to claim 13, the use of an AC cycle would inherently provide a sinusoidal waveform.

Response to Arguments

5. With respect to the rejection of Claims 1-5, 7-9 and 13 under 35 U.S.C. 102(b) as being anticipated by Konrad (US 5,789,167), the rejection has been withdrawn in view of the amendments to claim 1 and related comments (See page 4 of the response filed 9/14/2006). A new grounds of rejection has been made over Konrad (US 5,789,167) in view of Northrup et al. (US 6,979,424), Kaji et al.(Biophysical Journal) and Lizardi (US 5,059,294).

6. With respect to the rejection of Claims 10-12 under 35 U.S.C. 103(a) as being unpatentable over Konrad (US 5,789,167), this rejection has been withdrawn in view of the amendments to claim 1 and related comments (See pages 4-5 of the response filed 9/14/2006). A new grounds of rejection has been made over Konrad (US 5,789,167) in view of Northrup et al. (US 6,979,424), Kaji et al.(Biophysical Journal) and Lizardi (US 5,059,294).

With respect to Applicants' comments concerning the preamble and cyclic electrical field, the structure of the modified device as discussed in the new ground of rejection structurally meets the instant claim language. The reference of Lizardi was cited to evidence that the electric field generated by the power supply of Kaji et al. is capable of and/or actually does provide a cyclic electric field as is required of the instant claim language even though the reference of Kaji et al. is silent with respect to a cyclical pattern of movement when using an AC field to extend the nucleic acids. Furthermore, a recitation of the intended use of the claimed invention must

Art Unit: 1744

result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

7. With respect to the rejection of Claim 6 under 35 U.S.C. 103(a) as being unpatentable over Konrad (US 5,789,167) in view of Northrup et al. (US 6,979,424), this rejection has been withdrawn in view of the amendments to claim 1 and related comments (See pages 5-6 of the response filed 9/14/2006). A new grounds of rejection has been made over Konrad (US 5,789,167) in view of Northrup et al. (US 6,979,424), Kaji et al. (Biophysical Journal) and Lizardi (US 5,059,294).

Applicants also comment that it would not have been obvious to modify the device of Konrad with vents when using the disclosed AC field because no gas is generated. In response, this may be true of high frequency electric fields associated with dielectrophoresis, however, the reference of Konrad also evidences that gas is generated during the use of the device (See e column 23, lines 14-15). As a result, when using DC or low frequency AC electric field as suggested by the reference of Kaji et al., it would have been within the purview of one having ordinary skill in the art to provide vents as suggested by the reference of Northrup et al.

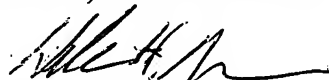
Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William H. Beisner whose telephone number is 571-272-1269. The examiner can normally be reached on Tues. to Fri. and alt. Mon. from 6:15am to 3:45pm.

Art Unit: 1744

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gladys J. Corcoran can be reached on 571-272-1214. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



William H. Beisner
Primary Examiner
Art Unit 1744

WHB